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Adobe Reader or Adobe Acrobat

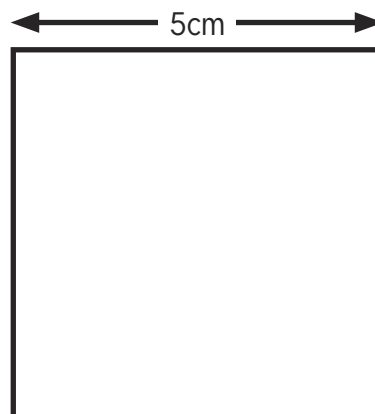
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Foxit Reader

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Name:

Edexcel Style

Combined Science GCSE

Magnetism and the Motor Effect

(Levels 4–9)

Date:

Time allowed: 50mins

Question	Links to Student Progress Sheet	Score	Total marks Available
1	12.1,12.2,12.3	7	
2	12.3,12.5	8	
3	12.7	2	
4	12.9	10	
5	12.12,12.13	13	
6	12.9	10	
Total			50

Score	Estimated Grade
47 – 50	9
40 – 46	8
33 – 39	7
28 – 32	6
24 – 27	5
20 – 23	4

Please be aware that these grade boundaries are Twinkl's own, and may not be in-line with Edexcel's own.

Area for Improvement:

Cell Structure and Function

1. (a) Label the magnetic poles on the magnets below.

Repel

Attract

(2)

- (b) State 2 magnetic materials.

- (c) Is magnetism an example of a contact or non-contact force?

(1)

- (d) The magnetic field around a bar magnet can be illustrated by using field lines, as shown on the diagram below. Using the diagram below:

(1)

- i) Add arrows to show the direction of the force.

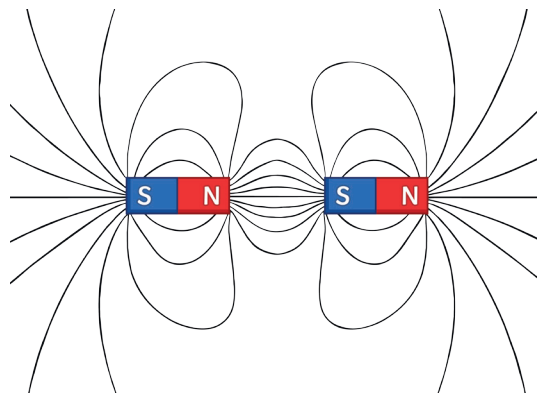
(1)

- ii) Label an area where the field is strongest.

(1)

- iii) Label an area that shows a uniform field.

(1)

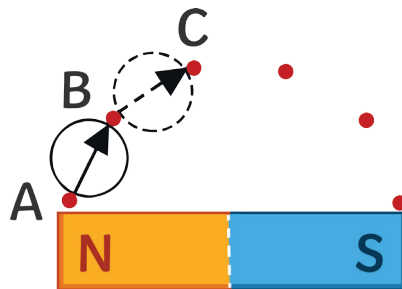


2. (a) Magnets can be permanent or induced, explain the difference.

(1)

(b) A group of students decided they could plot a bar magnets magnetic field using a plotting compass. Explain how the students would be able to do this, a diagram may help you with your explanation.

(4)



(c) State 4 everyday uses of magnets.

(2)

(d) What is the earth's magnetic field caused by? ✓ the correct answer.

Liquid iron movement in the earth's outer core.

A permanent magnet in the earth's core.

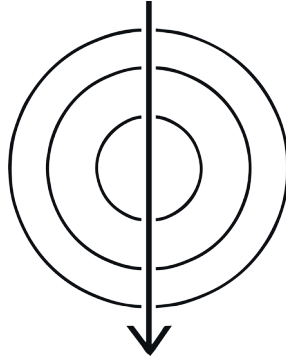
The earth's gravitational field.

(1)

3. (a) When a current flows through a wire a magnetic field is created. Explain how you can work out the direction of a field if you know the direction of the current.

(1)

- (b) State the field direction in the example below.



(1)

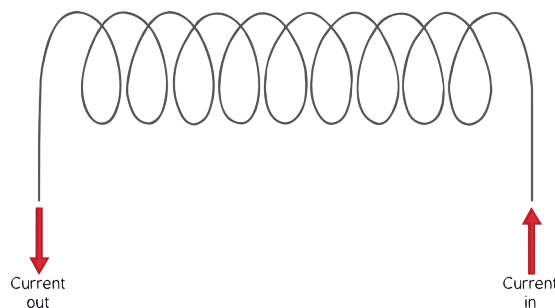
4. (a) What is a solenoid?

(1)

- (b) What name is given to a solenoid that has an iron core?

(1)

- (c) The diagram below shows a solenoid, draw the magnetic field around the solenoid.



(2)

- (d) Scrap yards use electromagnets to move cars from one place to another, explain why electromagnets are the most suitable type of magnet to use in this situation.

(4)

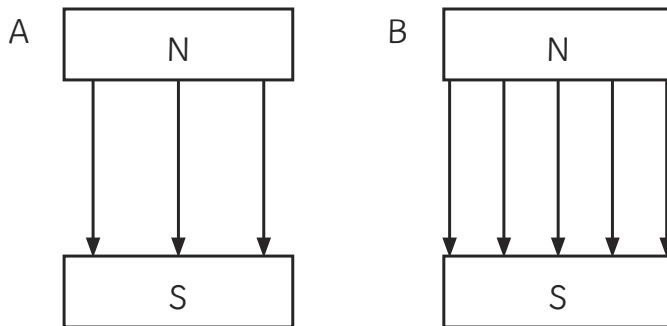
(e) Complete the following sentences by selecting the correct words from the box below.

magnetic, weak, opposite, strong, uniform

Inside a solenoid the field from individual coils form a _____ field along the centre of the solenoid and give a _____ field outside the solenoid.

(2)

5. (a) Using the diagrams below, indicate which diagram has a large magnetic flux density.



(b) State the unit of magnetic flux density.

(1)

(c) Explain how Fleming's left hand rule can be used to find the direction of the force.

(d) State the equation that enables the strength of the motor effect to be calculated. Remember to include all units.

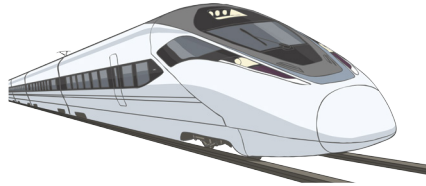
(e) Calculate the force produced when the magnetic flux density is 3T, the length of the wire 50cm and there is a current of 2A.

(2)

(f) Calculate the magnetic flux density of a field when a 47cm piece of wire experience a force of 10N, with a current of 3A is flowing through it.

(3)

6. (a) The image below shows a maglev train.



Explain how magnets are used to help reduce friction.

(2)

(b) A group of students want to have a competition to find out which group can produce an electromagnet that will pick up the most paperclips. To make the competition fair it was decided that each group should be given the same equipment as stated below.

Equipment:

battery, iron nail, 50cm of wire and many paperclips.

i) Explain how the pupils would produce an electromagnet. If necessary include diagrams.

(2)

ii) State 2 ways that the students could increase the strength of their electromagnet.

(2)

ii) State what would happen when the current was switched off.

(2)

(c) State 2 ways the direction of a motor can be changed .

(2)